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Non-Technical Abstract

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Abstract

The lifecycle employment profiles of minority labor migrants who came to Norway in the early 1970s diverge significantly from those of native comparison persons. During the early years, employment in the migrant group was nearly complete and exceeded that of natives. But, about ten years upon arrival, immigrant employment started a sharp and steady decline, and by 2000 their employment rate was 50 percent, compared to 87 percent for the native comparison group. We find that immigrant employment is particularly sensitive to the business cycle, and that the economic downturns of the 1980s and 1990s accelerated their exit from the labor market. We trace part of the decline to the migrants initially being overrepresented in shrinking industries and occupations. But we also identify considerable disincentives embedded in the social security system that contribute to poor lifecycle employment performance of immigrants with many dependent family members.

I. Introduction

With the aging of their native population, many developed nations are approaching a 'demographic deficit' with soaring dependency ratios. Most of these nations have, at some point over the past decades, adopted legislation that restricts immigration flows from developing countries. Given the large pool of potential foreign labor, a possible policy response to the problem of an aging population is to ease immigration restrictions and admit more labor migrants from less developed countries. This issue is high on the political agenda in many rich countries.[1] As shown by Storesletten (2000; 2003), immigration has the promise of mitigating the fiscal burden associated with aging populations both in the United States and in Europe, but these prospects hinge crucially on how immigrants fare in the labor market and, in particular, on their expected labor market participation rates. By requiring labor migrants to be employed upon arrival, close to full participation is ensured initially. However, the impact of immigration on overall fiscal conditions also depends on the long-term employment patterns of labor immigrants as well as their families.

Studies from Europe, North America, and Australia find that immigrants assimilate into the host country's labor market, and that, e.g., earnings gaps between immigrants and natives narrow with the number of years since migration (Chiswick, 1978; Borjas, 1999; Bauer *et al*., 2000).[2] There are important differences across host countries, however, with respect to the selection of immigrants, the presence of xenophobia and discriminatory practices, and work

[1] For example, the Commission of the European Communities (2005, p. 4) states that "… while immigration in itself is not a solution to demographic ageing, more sustained immigration flows could increasingly be required to meet the needs of the EU labour market and ensure Europe's prosperity."

[2] Recent studies of immigrant earnings assimilation in the Scandinavian countries include Edin *et al*. (2000) for Sweden, Husted *et al*. (2000) for Denmark, and Barth *et al*. (2004) for Norway. The evidence from these studies indicates significant assimilation effects among immigrants in general, but also that the assimilation process varies importantly according to arrival cohort, country of origin, and class of admission.

incentives facing immigrants. Hence, empirical findings regarding the assimilation process of immigrants may not be directly transferable across different countries. In welfare state economies, one could speculate that a more open-border immigration policy may result in a mix of immigrants that adds to the fiscal challenges rather than alleviating them. Countries with an egalitarian wage structure might be considered a more attractive destination for low-skilled than for high-skilled immigrants (Borjas, 1987). And countries with generous and costly social security systems might be more attractive for individuals who foresee a high probability of becoming dependent on the social security system than for individuals who expect to have to pay for it. Hence, the structural characteristics of European labor markets and social security systems entail the risk of attracting immigrants with weak employment prospects.

As legal restrictions have limited immigration flows from less advanced countries to European welfare states, there has been little scope for empirical evaluation of assimilation processes of *labor migrants* from developing nations. Over recent decades, immigrants from developing countries have typically entered as part of a family reunification process or seeking political asylum, with very few admitted on the basis of employment. Empirical evidence indicates that these immigrant groups have substantially higher inactivity rates than natives in European host countries (see, e.g., OECD, 2001). Differences between immigrants and natives in employment are likely to be mirrored in their welfare dependency rates. In an otherwise scant literature, Hansen and Lofstrom (2003) and Riphahn (2004) show that immigrant groups originating in poor countries are more likely to collect social assistance than other immigrants and natives in Sweden and Germany, respectively. It remains unclear, however, whether such nativity and country-of-origin differences in employment status and welfare use merely relate to the fact that many immigrants from developing countries came for reasons of political persecution or family reunification, and not primarily for the purpose of seeking work, or whether

the patterns represent structural deficiencies in the host countries' ability to integrate minority immigrants into their labor markets.

In the present paper, we follow the wave of labor migrants that arrived in Norway from developing countries during the period 1971 to 1975, just before Norway imposed a freeze on labor immigration from outside the Nordic countries. Based on access to administrative registers, we track their employment history over the 30 year period from the date of entry until year 2000. For the last third of the observation period, we can also study participation in public welfare programs. The labor market outcomes and assimilation process of this group of migrant workers are of particular relevance for public policy. If the underlying migration motive is important for labor market performance in the host country, the long-run experience of this wave of labor migrants may convey valuable information about the expected labor market behavior of would-be immigrants were borders to be reopened.

Our main findings are rather dismaying. Focusing on male immigrants from the four largest nonwestern countries of origin during the relevant period (Pakistan, Turkey, India, and Morocco), we find that labor market participation was very high during the first ten years upon arrival, with employment rates consistently above 96 percent and exceeding those of a native comparison group (matched on age and education). After ten years, however, employment among the labor migrants declined sharply. And by year 2000, only 50 percent of the labor migrants were still in employment, compared to 87 percent of the native comparison group. The great majority of the labor migrants under study were later joined by a spouse from the source country. The long-term labor market outcomes of the spouses are even less favorable than those of their husbands. For example, the spouse employment rate never exceeded 40 percent, and by 2000, it had declined to 30 percent, compared to 80 percent for the spouses of the native control group. After they left the labor market, most of the labor migrants claimed various types of social

security benefits. In 2000, we find that 74 percent of the non-employed labor migrants (and 28 percent of their non-employed spouses) received a permanent disability pension and that more than 90 percent received some form of social security transfer.

The paper examines the dynamic process by which immigrants and natives become non-employed, in terms of *incidence* and *persistence*. We find that around three quarters of the immigrant-native employment differential can be attributed to differences in non-employment incidence. Having left employment, the prospects for re-entry deteriorate more rapidly for immigrants than for natives, and immigrants require longer tenure in a new employment spell to attain job security. We also find that immigrant movements out of and back into employment are particularly sensitive to business cycle fluctuations. This sensitivity, combined with their stronger duration effects, led to lasting negative effects of the economic downturns of the 1980s and 1990s on immigrant employment.

The paper discusses alternative explanations behind the weak long-term employment performance of the labor migrant group. We end up focusing on two key mechanisms. First, we show that the migrants disproportionately held jobs in industries and occupations where even natives experienced relatively short employment careers. Second, we argue that the Norwegian welfare system—with high replacement ratios for household heads with low labor earnings, a non-working spouse, and many children—provides weak work incentives for families of the type that dominates the cohort of labor migrants considered in this paper. These conclusions are based on analyses where we, for those employed in 1980, examine employment status in year 2000 conditional on a wide range of characteristics describing the jobs they held twenty years earlier (such as occupation, industry, pay, and location) and a vector of family characteristics that influence the social security replacement ratio (the number of children and the presence of a non-working spouse). An intriguing finding is that the two factors, job characteristics and family

structure, explain equally sizeable shares of the immigrant-native employment differential in 2000—conditioning on each of the sets of variables reduces the differential by close to one third.

The next section provides a description of our data and gives a brief empirical overview of employment patterns and social security take-up rates. Section III presents a longitudinal analysis of labor market transitions for immigrants and natives, aimed at decomposing the employment differential into non-employment incidence and persistence, and to examine the impacts of key determinants like age, years since migration, and local labor market tightness. Section IV discusses the underlying economic mechanisms, and Section V concludes.

II. Data and Empirical Overview

The empirical analyses are based on data samples assembled from administrative registers covering the complete immigrant and native populations of Norway in year 2000. Immigrant status is defined by country of birth and year of arrival. Foreign-born individuals with Norwegian-born parents and Norwegian-born with immigrant parents are excluded from the samples. Our aim is to study lifecycle employment of adult, work-oriented immigrants from developing countries. This motivates our extract of immigrant men born between 1936 and 1955 who entered Norway between 1971 and 1975 from one of the following four countries: Pakistan, Turkey, India, and Morocco. (These four countries account for 81.2 percent of the non-European male immigrants in the relevant birth and entry cohorts.) For that cohort, admission to Norway required prior issuance of a work permit which in practice meant that the migrant held a job offer at the time of entry. Around 1970 Norwegian manufacturing experienced shortages in domestic labor markets and actively recruited workers from developing countries. The immigrant wave was further spurred by restrictions on labor immigration imposed elsewhere in Europe and, in

particular, by the strict policies implemented in Denmark in November 1970 (Castles, 2006; Tjelmeland and Brochmann, 2003). Relatively few labor migrants from developing countries arrived before 1971 (Bratsberg *et al*., 2007), and, in 1975, Norway invoked a temporary moratorium on immigration from outside the Nordic region. Following the 1975 moratorium, new legislation favored admission based on family reunification and political asylum rather than work. As we also describe below, the vast majority of the cohort members were later joined by a spouse and close relatives who entered as part a family reunification process. As such, the migrant cohort under study set the stage for substantial subsequent immigration flows to Norway. To illustrate, the Pakistani-born members of our sample, fewer than 1,700 in number, form the origin of the largest foreign national group in Norway at the turn of the century. (As of January 1, 2001, there were 24,000 persons of Pakistani descent residing in Norway.) Unlike for the large immigrant groups that were admitted to Norway during the 1980s and 1990s, the labor migrants of the 1970s were not offered any formal instruction in Norwegian language or society.[3]

A. Employment patterns among immigrants and natives

Our employment data draw on individual histories of accumulation of credit points in the Norwegian public pension system. Earned pension credit points in a given year are tied to the individual's earnings that year. In principle, all labor-related earnings constitute the basis for calculation of credits, including wage and salary incomes, self-employment earnings,

[3] As employment was not typically the prime migration motive for female nonwestern immigrants who arrived in the early 1970s, we focus on men. Using the same sampling criteria as for the male sample, we find that the 1976 employment rate of female immigrants was less than 30 percent, compared to 97 percent for males, which strengthens the case for gender differences in migration motive. Moreover, 67 percent of the female group was in fact married to a member of the male migrant cohort under study (in 2000). The employment experiences of the spouses of the male cohort are discussed towards the end of the paper.

unemployment benefits, long-term sick leave benefits, and maternity leave allowances.[4] Specifically, credit points are computed from total annual earnings and the social security base figure (*G*, which equals NOK 70,246, or about $11,700, in 2008). Individuals receive no credits unless their earnings are at least *1 G* and we define an individual as being employed during the year if he earned at least some credits that year.

To make the native-born reference group comparable to the migrant cohort, we stratify the native sample so as to match the distributions of birth year and education in the migrant sample. Table 1 lists means of key variables in the two samples. About 65 percent were born between 1946 and 1955 (i.e., they are less than 54 years of age in 2000). Pakistani natives make up two thirds of the cohort, followed by immigrants from Turkey and India (around 15 percent each), and finally immigrants from Morocco with 6.5 percent. Close to one half of the immigrants arrived in 1971 or 1972. Not reported, the median age at arrival was 25, with two thirds of the cohort arriving between the ages of 20 and 28. Very few of the immigrants are unmarried and 94 percent of the married immigrant males have an immigrant spouse, compared to three percent among natives. The median year of arrival for the immigrant wife was six years after her husband.

The educational attainment of the migrant cohort compares favorably with attainment in the source populations, but unfavorably with education levels in Norway.[5] For example, according to the Pakistan Federal Bureau of Statistics (2004), 21 percent of Pakistani men born between 1949 and 1953, and 23 percent of those in the Punjab region (the source region for the

[4] Because unemployment insurance (UI) benefits enter the base for calculation of pension credits, we risk misclassifying some unemployed individuals as being employed. But since UI eligibility requires recent employment (normally the last calendar year), this potential measurement error is limited to the exact *timing* of long non-employment spells, not their occurrence.

[5] Unfortunately, information on attainment is missing for 15 percent of the immigrant sample. Educational attainment among the foreign-born is collected from the 1980 census of population, registers of Norwegian educational institutions, or from two surveys intended to complete the central education register and administered by Statistics Norway to all resident immigrants with missing schooling data in 1989 and 1999.

Table 1: Descriptive statistics

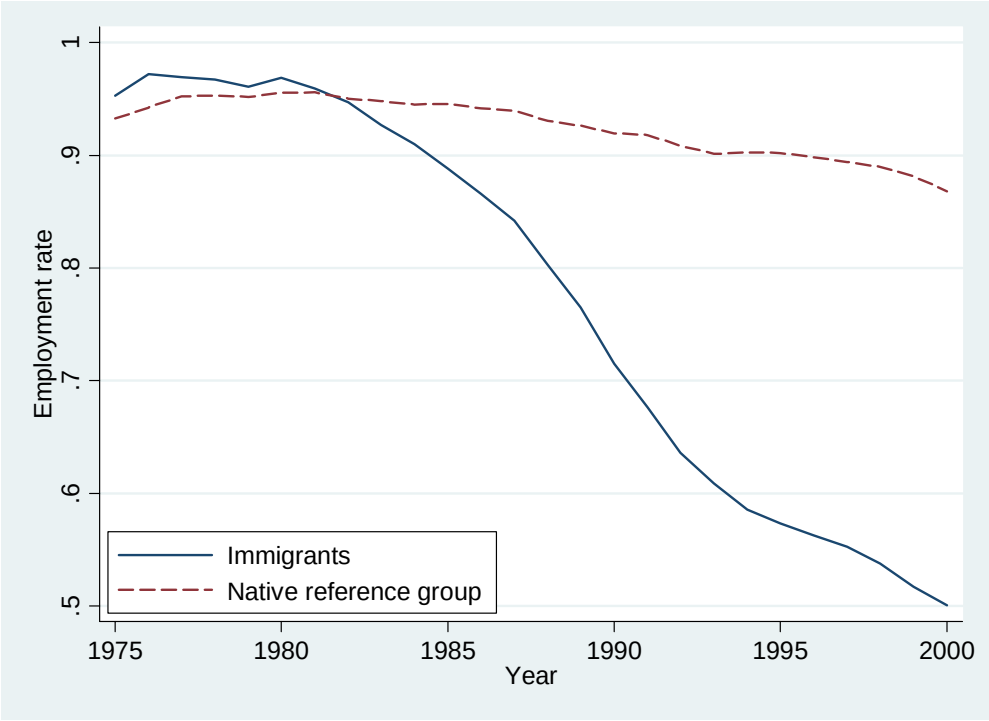
	Immigrants from Pakistan, Turkey, India and Morocco, arrived 1971-75	Matched group of Norwegian born
Birth cohorts		
1936-40	0.123	0.113
1941-45	0.227	0.222
1946-50	0.390	0.404
1951-55	0.260	0.261
Country of birth		
Pakistan	0.646	
Turkey	0.155	
India	0.134	
Morocco	0.065	
Year of arrival in Norway		
1971	0.354	
1972	0.119	
1973	0.131	
1974	0.220	
1975	0.176	
Educational attainment		
Not available	0.146	0.004
Less than 10 years	0.309	0.345
10-11 years	0.227	0.275
12 years	0.109	0.126
13-15 years	0.079	0.094
16+ years	0.130	0.156
Marital status		
Married	0.955	0.880
Immigrant spouse (among married)	0.938	0.032
Observations	2,553	28,720

Note: The native reference group is matched on the basis of birth year and educational attainment. The higher proportions in various education brackets for natives reflect a lower fraction with missing values recorded in the education register.

majority of our sample), have completed high school ('matric'). Even if we assume that those with missing education data only have compulsory schooling or less, the high-school completion rate for Pakistanis of that age group in our sample is 37 percent. In comparison, the completion rate among Norwegian-born men of those birth cohorts is 51 percent. (Conditional on non-missing data, the high-school completion rate in the migrant and the stratified native sample is 38 percent, as Table 1 shows.)

In Figure 1, we plot the employment shares of the labor migrant and native reference samples by calendar year over the 1975-2000 period. More than 96 percent of the labor migrant group was employed each year during the late 1970s and early 1980s, and in this period their

Figure 1: Trends in employment 1975-2000; 1971-75 labor migrants and native reference group



employment rate was even higher than that of natives. Around 1982, the employment share in the immigrant group started a steady decline and fell to 50 percent by year 2000. The employment rate in the native reference group also started a slow decline at about the same time, but the slope was much smaller with about 87 percent of the native group employed by the end of the sample period.[6]

B. Where have all the (previously) employed immigrants gone?

Underlying our data set, various administrative registers provide information on public transfers and welfare program participation. To examine the economic status of immigrants who are not

[6] We also examined employment of male immigrants from the neighboring Scandinavian countries who entered during the same period and who remained in Norway until 2000. The employment profile of this group is remarkably similar to that of natives; to illustrate, their 2000 employment rate was 88 percent. Complicating a study of long-term employment among migrants from the neighboring countries is their very high propensity to outmigrate. Data from the migration register show that, by 2000, fully 72 percent of the original Scandinavian cohort had permanently left Norway (compared to only 23 percent of the cohort under study; see the discussion in section II C).

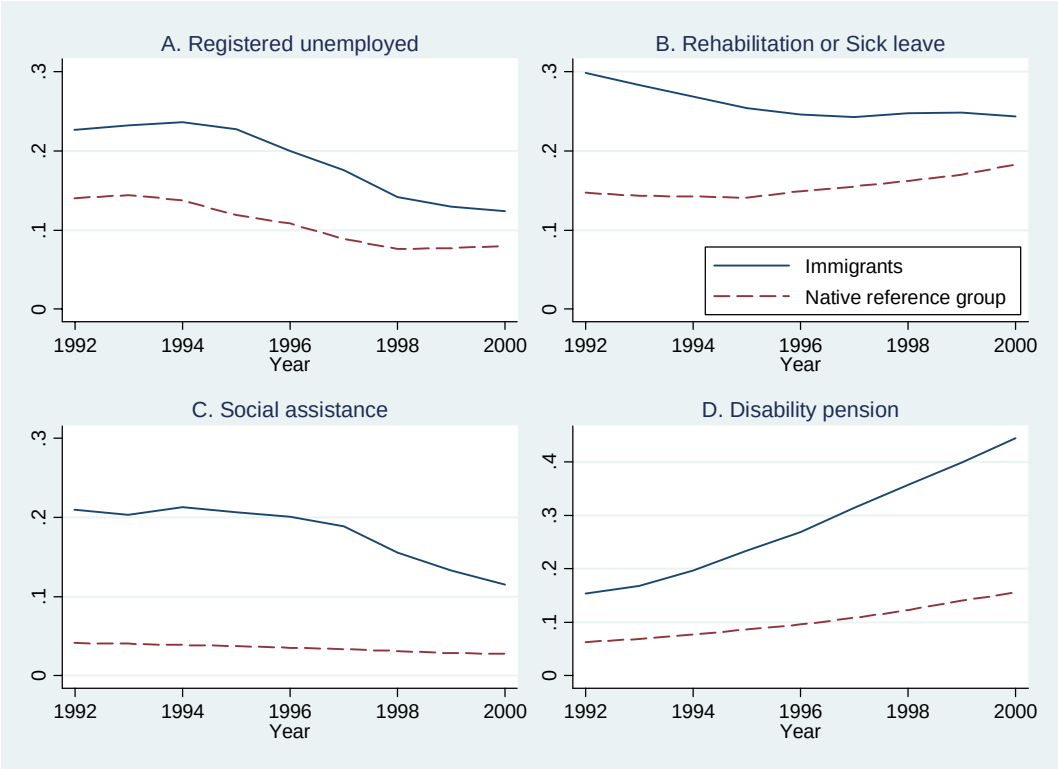
Table 2: Year 2000 rates of unemployment incidence, sick leave, rehabilitation, social assistance, and disability pension; males aged 45 to 64

	Immigrants from Pakistan, Turkey, India and Morocco, arrived 1971-75			Matched group of natives		
	All	Non-employed	Employed	All	Non-employed	Employed
Unemployment	.124	.112	.136	.080	.079	.080
Long-term sick leave	.176	.007	.344	.160	.010	.183
Rehabilitation	.083	.097	.068	.036	.086	.028
Social assistance	.115	.181	.049	.028	.121	.014
Disability pension	.444	.737	.152	.156	.703	.072
At least one transfer	.734	.901	.567	.370	.823	.301
Early retirement	.003	.005	.002	.010	.027	.008
Children	.943	.936	.951	.849	.725	.868
Married	.955	.938	.972	.880	.751	.899
In data or married	.991	.982	1	.996	.971	1
Observations	2,553	1,275	1,278	28,720	3,785	24,935
Percent of sample	100.0	49.9	50.1	100.0	13.2	86.8

Note*: Unemployment* (incidence): appearance at least once in the end-of-month registers of the Public Employment Service (which includes active labor market program participants). *Long-term sick leave*: receipt of state sick leave benefits for medical leaves exceeding sixteen working days; only those with a job are eligible for this transfer. *Rehabilitation*: recipient of cash transfer related to vocational or medical rehabilitation. *Social assistance*: recipient of means-tested support in form of a cash transfer or, less commonly, a loan. *Disability pension*: receipt of a permanent disability pension, unconditional on degree of disability. Entitlement is subject to a medical test, but studies show that the program served as an exit route to early retirement during the recession of the early 1990s (Dahl *et al*., 2000).

employed, we next describe patterns of registered unemployment, disability pensions, and transfers such as social assistance in 2000 (see Table 2). The immigrant cohort is more likely to experience unemployment or receive a welfare transfer than the native reference group. Fully 73 percent of the immigrants are transfer recipients or registered unemployed during the year, compared to 37 percent of the native males. Forty-four percent of the immigrants receive a permanent disability pension, compared to 16 percent among natives. This major difference between the two groups largely reflects variation in employment status, although immigrants are more likely to receive transfers even conditional on employment status. As a further check of the residency status of the non-employed, we also looked for a child or a spouse in the population register. As the table shows, this condition holds for a large majority (94 percent) of the non-employed immigrants.

Figure 2: Unemployment and transfer program participation 1992-2000, by immigrant status



The data underlying the descriptive statistics in Table 2 are available from 1992 onwards. In Figure 2, we display the trends in registered unemployment and participation in the various transfer programs over the 1992-2000 period. Unemployment and welfare program participation rates were consistently higher for immigrants compared to natives throughout the period, but the figure illustrates a compositional change taking place over the decade. High unemployment and extensive participation in sickness and rehabilitation programs stand out from panels A and B when we look at the immigrants' experiences during the first half of 1990s. Social assistance was also common as more than one in five immigrants received this benefit. Over time, disability pension has gradually replaced other social security transfers. Presumably, many immigrants with long unemployment spells and rehabilitation needs failed to get back into employment and were entitled to a permanent disability pension. Disability pension uptake seems to follow non-

employment with a time lag. In 1992, about one third of the non-employed immigrants in the sample received a disability pension. By 2000, this proportion had grown close to three out of four. As is evident from panel D, the decline in immigrant employment is mirrored by a sharply rising trend in disability retirement.

Social assistance rates among immigrants drop towards the end of the decade (see panel C). In the literature, longitudinal patterns of receipt of social assistance have formed the basis for assessments of whether immigrants 'assimilate into or out of welfare' (Hansen and Lofstrom, 2003; Riphahn, 2004). For the immigrant cohort under study, sole focus on social assistance would have led us to erroneously conclude that welfare dependency fell over time. In truth, welfare participation in the immigrant group increased substantially over the period, with the economically more favorable disability retirement replacing reliance on social assistance. The finding underscores the importance of considering the multitude of programs that make up the welfare state when assessing immigrant-native differences in welfare participation.

C. Return migration

The fact that we are able to locate more than 98 percent of the immigrants who are not employed in 2000 in the unemployment register or as recipients of a welfare transfer, or identify a spouse or child in the Norwegian population register, debunks the more mundane explanation that the observed pattern of declining employment is simply an artifact of unregistered outmigration taking place over time. But the question remains whether those who stayed in Norway for the 30 year period are representative of the original immigrant cohort. Of particular concern is that the narrow income distribution and the extensive social insurance programs of Norway compared to

the source countries might provide greater incentive for continued stay among the least skilled in the original migrant pool (Borjas and Bratsberg, 1996).[7]

Drawing on data from the central migration register, we identify 3,565 immigrants as belonging to the original cohort (based on gender, country and date of birth, and date of arrival).[8] In Figure 3, we trace the fraction of the original cohort that remained in Norway over time. The plot shows a marked decline early on, indicating that most of the outmigration events took place very soon after arrival. By 1978, 14 percent of the cohort members had left the country. Thereafter, mortality and outmigration contributed to only a slow reduction in the fraction remaining and, in 2000, fully 72 percent of the original immigrant cohort remained alive and residing in Norway, with five percent registered deceased (i.e., they died while in Norway) and 23 percent permanently out of the country.

It is worth observing that payment of the main transfer benefit listed in Table 2, permanent disability, does not require residency in Norway. In fact, a number of the original cohort members who return migrated to their home country received their disability pension from Norwegian authorities there (Riaz, 2003).[9] Because we focus on those who remained in Norway in 2000, permanent outmigrants are not captured by our analyses. In the data, we are able to link moves abroad between 1993 and 2000 to employment and welfare transfer records. More than six percent of our sample (163 persons) had a temporary stay out of the country during this period, and an additional 124 persons from the original cohort left permanently during the late 1990s.

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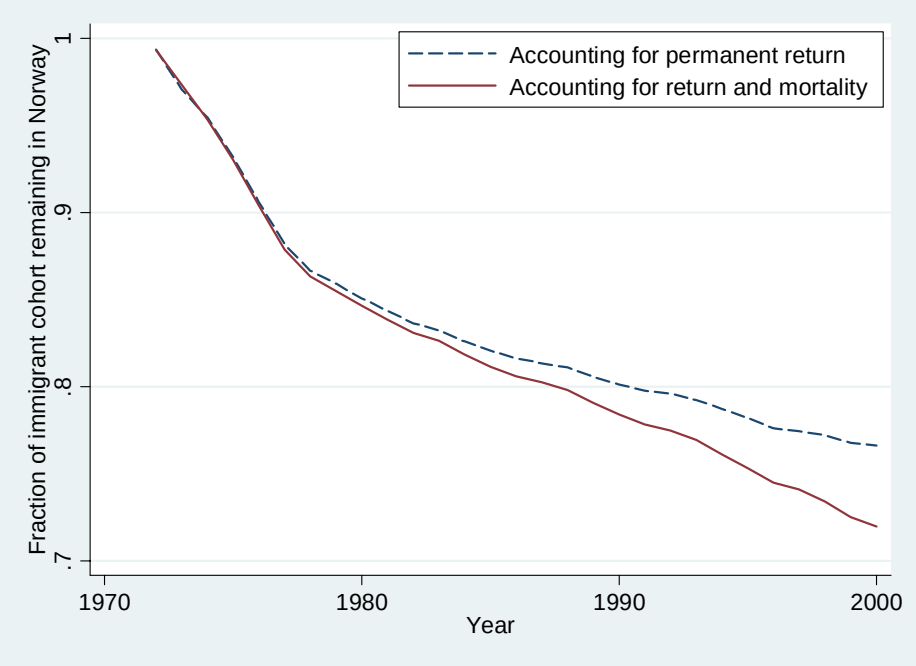
[7] Data from the World Bank show that, around 1970, the ratio of income accruing to the top 10 percent to the bottom 20 percent of the income distribution was 3.5 in Norway, compared to 5.3 in India, 5.4 in Pakistan, 9.5 in Morocco, and 12.0 in Turkey.

[8] The migration register data are described in detail in Bratsberg *et al*. (2007). Unfortunately, we can not link the records from the migration register to the pension credit data.

[9] In 2003, 257 persons in Turkey, 137 in Pakistan, and 120 in Morocco received benefits from the Norwegian pension system (Riaz, 2003). These counts do not all relate to the immigrant cohort under study, however.

Figure 3: Fraction of original immigrant cohort not permanently outmigrated or dead



Note: Sample size is 3,564.

The data reveal that outmigrants had worse employment outcomes than those who remained. For example, the 1990 employment rate was 43 percent among those who left permanently in the late 1990s (compared to 72 percent in our sample), and, in 1992, 24 percent of the permanent outmigrants received a disability pension (vs. 15 percent of our sample). In 2000, 39 percent of the outmigrants received a disability pension while living abroad. That year, the employment rate among the temporary outmigrants was 40 percent, compared to 51 percent among stayers. The observed negative correlation between outmigration and employment, along with the direct and auxiliary evidence on disability pensions paid out in source countries, shows that permanent outmigration was not strictly dominated by positive selection. But, even in the extreme event where all of the outmigrants remained in Norway and were employed in 2000, the immigrant employment rate would be no higher than 62 percent. What is clear is that selective outmigration cannot be a major driver of the observed decline in immigrant employment.

III. Empirical Analysis of Labor Market Transitions

Why does the employment rate of labor migrants decline so rapidly compared to that of natives? In this section, we set up a statistical model aimed at investigating how the employment propensity depends on age, education, local labor market conditions, and, for immigrants, years since migration. A key feature of the model is that it makes it possible to disentangle the immigrant-native difference in non-employment propensities into differences in *incidence*, on the one hand, and *persistence*, on the other. The set-up also allows the degree of state duration dependence to differ between the two groups. The model specifies yearly transitions between the states of employment and non-employment within the framework of a discrete-time duration model.

A. Methodology

In the empirical model, transitions between the states of employment and non-employment are assumed to be governed by logistic probability functions. Let $y_{jt}=1$ if individual j was employed in year t, and zero otherwise. Let $l(.)$ be a logistic probability function, i.e., $l(a) \equiv \exp(a)/(1+\exp(a))$. The transition probabilities are then modeled as

$$
\begin{aligned}
&P(y_{jt}=0 \mid y_{jt-1}=1) \\
&= l\left(\begin{array}{l}\left(\alpha_i^1 I_j + \alpha_n^1 (1-I_j)\right) A_{jt} + \beta_i^1 I_j YSM_{jt} + \left(\delta_i^1 I_j + \delta_n^1 (1-I_j)\right) E_j \\ +\gamma^1 R_{jt} + \sigma^1 CY_{jt} + (\varphi^1 + \varphi_i^1 I_j) u_{jt} + \left(\lambda_i^1 I_j + \lambda_n^1 (1-I_j)\right) D_j + \psi^1 I_j + \nu_j^1\end{array}\right), \\
&P(y_{jt}=1 \mid y_{jt-1}=0) \\
&= l\left(\begin{array}{l}\left(\alpha_i^2 I_j + \alpha_n^2 (1-I_j)\right) A_{jt} + \beta_i^2 I_j YSM_{jt} + \left(\delta_i^2 I_j + \delta_n^2 (1-I_j)\right) E_j \\ +\gamma^2 R_{jt} + \sigma^2 CY_{jt} + (\varphi^2 + \varphi_i^2 I_j) u_{jt} + \left(\lambda_i^2 I_j + \lambda_n^2 (1-I_j)\right) D_j + \psi^2 I_j + \nu_j^2\end{array}\right),
\end{aligned}
\tag{1}
$$

where the subscripts (i,n) are used to denote immigrant and native, respectively, I_j is a dummy variable for immigrant status, A_{jt} is a set of dummy variables for age (21,22,…,64); YSM_{jt} for

years since migration (3,4,…,29); R_{jt} for (seven) regions in Norway; CY_{jt} for calendar year; E_j for educational attainment (≤ 9, 10-11, 12, 13-15, ≥ 16, missing); D_{jt} for continuous duration in the present state (1,2, ≥ 3 years), and u_{jt} is the local unemployment rate relevant for individual *j*. All of these variables (except for immigrant status and educational attainment) are time varying. In addition, each individual is characterized by the unobserved time-invariant covariates (v_j^1, v_j^2). Controlling properly for the presence of unobserved heterogeneity is crucial in this model, since unobserved sorting would otherwise bias the parameters attached to duration variables, such as state duration and years since migration. Without controlling for unobserved heterogeneity, it indeed turns out that we would grossly overstate any negative state duration dependence (for both immigrants and natives and for both states) and in addition introduce a major spurious source of favorable (i.e., negative) *YSM* effects on the immigrant exit rates from employment. The latter result reflects the fact that immigrants with the poorest employment prospects are the first to exit the labor market, leaving behind an increasingly positively selected group with fewer exits as time since migration increases.

With two exceptions, our explanatory variables are allowed to affect employment transitions of the two groups differently. The exceptions are the calendar year (CY_{jt}) and region (R_{jt}) indicator variables, which we assume have the same impacts on (the log-odds ratios of) immigrants and natives. Because years since migration must equal the difference between current calendar year and the year of arrival, *YSM* is almost perfectly correlated with calendar year in the immigrant sample. The restriction that the calendar time effects are the same for the two groups permits identification of *YSM* effects, as calendar effects basically are identified from the native sample (Borjas, 1999). We nevertheless allow for differential responsiveness of immigrants and

natives to economic fluctuations through the interaction of local unemployment and the immigrant variable (Bratsberg *et al*., 2006).

At first glance, the model set-up appears to involve an initial conditions problem related to the distribution of initial states and durations. Note, though, that the population under study consists of labor migrants, who *by definition* were employed around the time of entry. For virtually all of them, this initial employment spell also lasted at least three years. Hence, we circumvent the initial conditions problem by defining a labor immigrant in this context as a person who came to Norway to work, and then remained employed for at least three years (we only lose 5 of the 2,553 immigrants as a result of this restriction, i.e., 0.2 percent of the sample). Similarly, we use the first occurrence of three consecutive years with employment as the event that triggers entry into the native comparison sample (we lose 145 of the 28,720 comparison persons as a result of this restriction, i.e., 0.5 percent of the sample). Given this sampling scheme, all of the individuals start out in the sample as employed, with the employment spell having lasted three years, and our model may be viewed as conditional on such an event having occurred.

Let Y_j be the set of outcomes observed for individual j during the observation window from 1971 to 2000. The likelihood of observing a particular sequence of these outcomes is

$$L_j(v_j^1, v_j^2) = \prod_{t \in Y_j} \left\{ \begin{array}{l} y_{jt-1}\left[\left(P(y_{jt} = 0 \mid y_{jt-1} = 1) \right)^{1-y_{jt}} \left(1 - P(y_{jt} = 0 \mid y_{jt-1} = 1) \right)^{y_{jt}} \right] \\ \times (1 - y_{jt-1}) \left[\left(P(y_{jt} = 1 \mid y_{jt-1} = 0) \right)^{y_{jt}} \left(1 - P(y_{jt} = 0 \mid y_{jt-1} = 0) \right)^{1-y_{jt}} \right] \end{array} \right\}, \quad (2)$$

where the two probability expressions are given in Equation (1). Since Equation (2) contains the two unobserved characteristics (v_j^1, v_j^2) it cannot be used directly in a data likelihood function. In order to eliminate the two unobserved covariates from the likelihood function, we take the expectation of individual likelihood contributions. To avoid arbitrary distributional assumptions,

we rely on the non-parametric maximum likelihood estimator (NPMLE); see Lindsay (1983) and Heckman and Singer (1984). This implies that the joint distribution of unobserved heterogeneity (v_j^1, v_j^2) is modeled by means of a discrete distribution with an a priori unknown number of support points. For Q support points, the data likelihood takes the form

$$L(Q) = \prod_{j=1}^{N} \sum_{q=1}^{Q} p_q L_j(v_q^1, v_q^2), \quad \sum_{q=1}^{Q} p_q = 1, \tag{3}$$

where (v_q^1, v_q^2) is the location vector of support point *q*, and p_q is the associated probability. Our computational strategy follows the procedure outlined in Gaure *et al.* (2007).[10] We first maximize Equation (3) with respect to all the parameters of the model for *Q=1* (no unobserved heterogeneity). We then add support points, one by one, and re-estimate the model as long as we are able to obtain an improvement in the likelihood function.[11] As a result of this process we end up with a model containing 8 support points in the heterogeneity distribution.[12] In total, the model contains 249 unknown parameters, 226 attached to observed characteristics and 23 describing the unobserved heterogeneity distribution. Gaure *et al.* (2007) show that standard statistical inference, based on the assumption of joint normality, can be made regarding parameters attached to observed characteristics, *as if* the number of support points in the heterogeneity distribution was known a priori.

Given our extensive use of dummy variables in the empirical model, it is difficult to interpret parameter estimates for each variable in isolation. Most of the results presented in this section therefore either take the form of simulated employment patterns based on the estimated

[10] See also www.frisch.uio.no/NPMLE.html.
[11] We consider this criterion to be met when the likelihood increases by less than 0.001.
[12] We have also estimated the model separately for immigrants and natives. These estimations ended up requiring 8 support points for natives and 5 points for immigrants. In the immigrant model, it was not possible to identify effects of calendar time and years since migration simultaneously. Otherwise the coefficient estimates were very similar to those reported in the paper. Complete results for the separate models are available upon request.

model, or of transition probability profiles generated for 'representative' individuals. In order to provide statistical confidence intervals for the simulated patterns, we apply the parametric bootstrap; i.e., we make repeated draws from the (multivariate normal) distribution of parameter estimates and use them in the simulation exercises.[13] Each result presented in this section is based on 100 replications, and 90 percent confidence intervals are constructed by removing the five percent most extreme results at each end. Confidence intervals for the transition probability profiles are generated by conditioning on a (representative) transition probability for a reference characteristic, and we then use the computed standard errors to calculate confidence intervals. Only a few selected parameter estimates (marginal effects) are presented in this section. A complete list of parameter estimates, with standard errors, is provided in the Appendix.

B. Employment profiles of immigrants and natives

In the upper panel of Figure 4, we first compare time profiles generated by repeated simulations based on the estimated model with the observed employment patterns of immigrants and natives. The profiles are drawn with respect to 'years since sampling,' i.e., years after each individual's first (three-year) employment observation in the dataset, normalized such that year 1 is the final year of the pre-conditioned employment spell. For immigrants, this corresponds closely to years since migration minus two. For the native reference group, this time dimension has no particular interpretation beyond that it facilitates a direct comparison with the immigrant group. Figure 4 illustrates that the model performs well in terms of replicating the observed employment histories.

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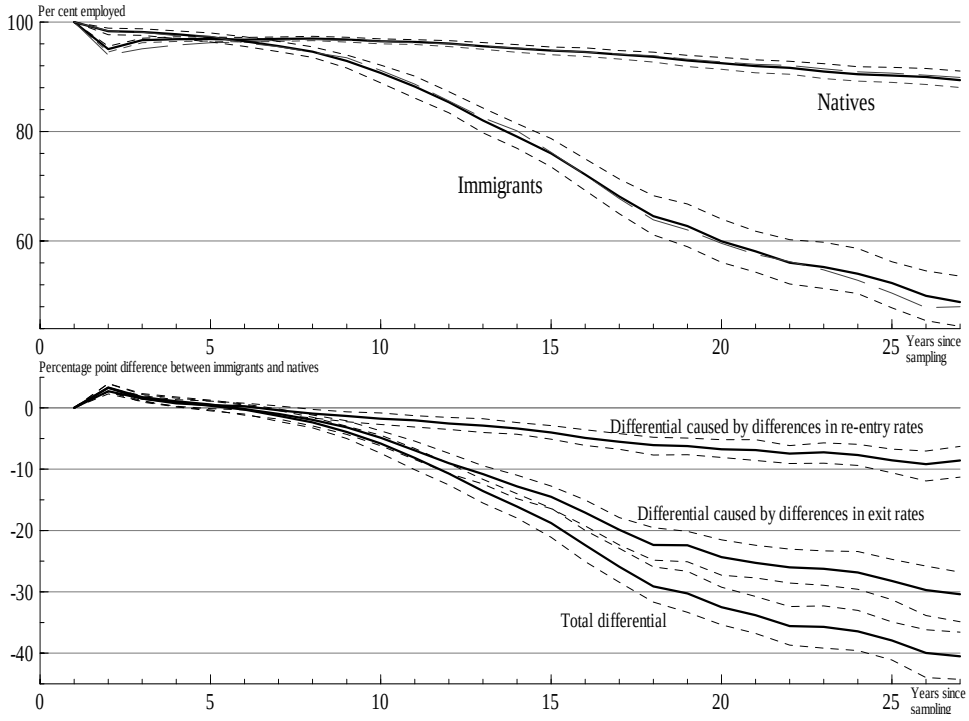
[13] In simulations, we make draws from the vector of 226 parameters attached to observed covariates only, since the parameters describing unobserved heterogeneity are not normally distributed; see Gaure *et al.* (2007). We thus condition on individual unobserved heterogeneity. Draws from the estimated parameter distribution are made by means of the Cholesky decomposition; that is, let L be a lower triangular matrix such that the covariance matrix is

Figure 4: Simulated and observed employment rates by years since sampling and the immigrant native employment differential decomposed



Note: Solid lines denote mean employment rates (or employment differentials) from the model simulations; dotted lines upper and lower boundaries of 90 percent confidence intervals. In the upper panel, long-dashed lines display the observed fractions in the data.

C. Exit, re-entry, and duration dependence

The lower panel of Figure 4 disentangles the immigrant-native employment differential into differences in exit and re-entry rates. The decomposition is obtained by making counterfactual simulations, such that immigrants are treated *as if* they were natives in the exit and re-entry processes, respectively. This exercise clearly shows that differences in exit rates are much more important than differences in re-entry rates for explaining the observed employment patterns. By the end of the period, 75 percent of the employment differential between immigrants and natives

---

$V = LL'$. Let z_s be a vector of 226 parameter draws from the univariate standard normal distribution collected for trial *s*, and let $\hat{b}$ be the vector of point estimates. The parameter draws of trial *s* are then given by $b_s = \hat{b} + Lz_s$.

Table 3: Estimates of the impact of selected variables on exit and re-entry rates (marginal effects)

	Immigrants		Natives	
	Exit	Re-entry	Exit	Re-entry
Mean observed transition rate in data (percent)	6.09	13.34	2.31	29.08
A. Duration dependence – time spent in present state				
1 year	Ref.=18.14	Ref.=46.81	Ref.=18.14	Ref.=46.81
2 years	-2.05	-11.89***	-5.07***	-10.77***
3 years	-7.17***	-24.04***	-12.62***	-19.84***
B. Educational attainment				
Less than 10 years	Ref.=6.87	Ref.=23.13	Ref.=6.87	Ref.=23.13
10-11 years	0.29	9.30***	-1.55***	5.95***
12 years	-1.96***	11.48***	-3.58***	9.36***
13-15 years	-1.35*	10.74***	-2.25***	6.25***
16+ years	-0.92	13.52***	-3.58***	9.38***
C. Local unemployment rate	0.20***	-1.46***	0.08***	-0.36**

Note: Marginal effects for immigrants and natives are evaluated at the same initial transition probabilities defined by the observed mean transition rate in the pooled sample for the reference groups (panels A and B) and for all individuals (panel C). The reported numbers in Panel C are the estimated impacts of a one percentage point increase in the rate of unemployment. Local unemployment is tabulated from registers of the Public Employment Service and includes participants on active labor market programs.
*(**)(***): Significant at the 10(5)(1) percent level. Coefficient estimates with standard errors appear in the Appendix.

can be attributed to differences in exit rates alone, 20 percent to differences in re-entry rates alone, and 5 percent to the interaction of the two.

There is a significant difference between immigrants and natives with respect to the degree of duration dependence; see Table 3, panel A. Extended periods outside employment entail declining re-entry probabilities for both immigrants and natives. During the first three years without employment, the average re-entry probability declines by 20 percentage points for natives and 24 percentage points for immigrants. For natives, the exit probability also drops sharply as a new employment spell extends beyond a year. After three years in a new spell the exit probability has declined by 13 percentage points for natives, compared to seven percentage points for immigrants. As these parameters are identified by formerly employed individuals who re-enter employment, the patterns show that immigrants do not experience the same reduction in the risk of non-employment from lasting employment spells as do natives.

D. Returns to human capital

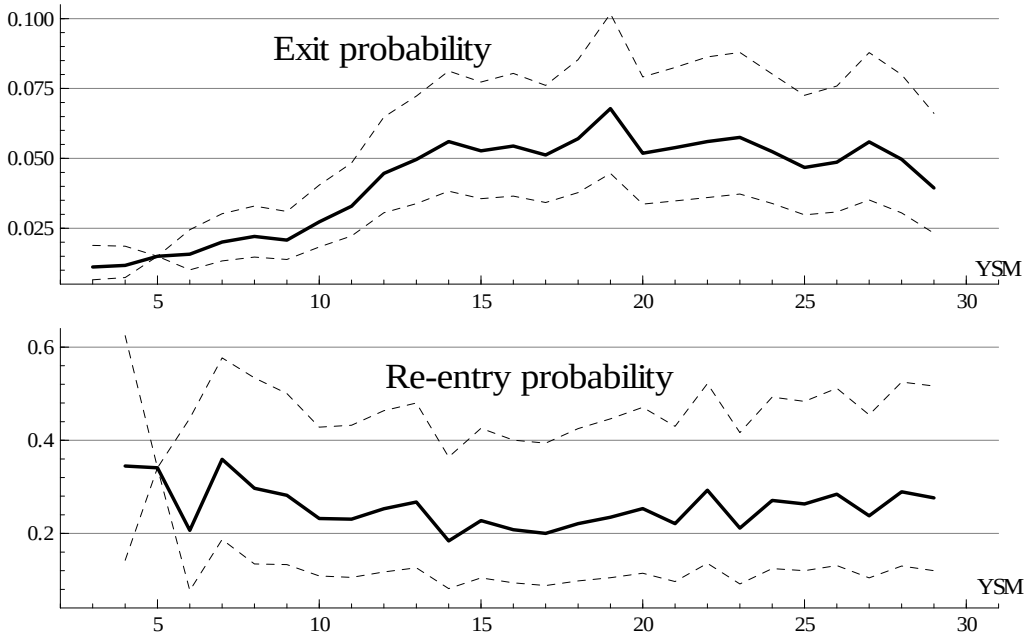
For natives, the exit rate declines strongly with educational attainment; see Table 3, panel B. At typical levels of exit, the exit rates are more than twice as high for natives with compulsory schooling only than for those who completed high school (12 years) or obtained a university degree (at least 16 years). For immigrants, educational attainment has only a modest impact on the exit rate. Even though there is a positive impact of education on re-entry rates for both natives and immigrants, this finding indicates that it has been difficult for the labor migrants to take full advantage of their schooling in the Norwegian labor market.[14]

E. Labor market dissimilation or differential age effects?

Figure 5 displays the estimated impact of years since migration (YSM) on the probabilities of exit and re-entry. Although these profiles are estimated with considerable statistical uncertainty (caused by the difficulty of disentangling YSM from age effects), the figure shows that the exit rate out of employment rises significantly with years since migration, conditional on age and calendar year. Hence, the data give no indication of immigrant assimilation, in the sense that their attachment to employment becomes stronger – relative to that of natives – with time in the host country. To the contrary, the plot bears witness of a strong *dissimilation* process. According to the point estimates, the probability of exiting the labor market from one year to the next increases, ceteris paribus, from less than 2 percent during the first 10 years in the country, to more than 5 percent after 15 years. The re-entry probability, on the other hand, seems to be stable with respect to years since migration.

[14] Friedberg (2000) documents limited portability of human capital acquired in the home country among immigrants in Israel, and Raaum (1998) shows that returns to schooling obtained abroad fall below returns to host-country schooling for immigrants in Norway. Bratsberg and Terrell (2002) attribute differences in returns to education across immigrant groups to variation in source-country school quality.

Figure 5: Exit and re-entry probabilities by years since migration



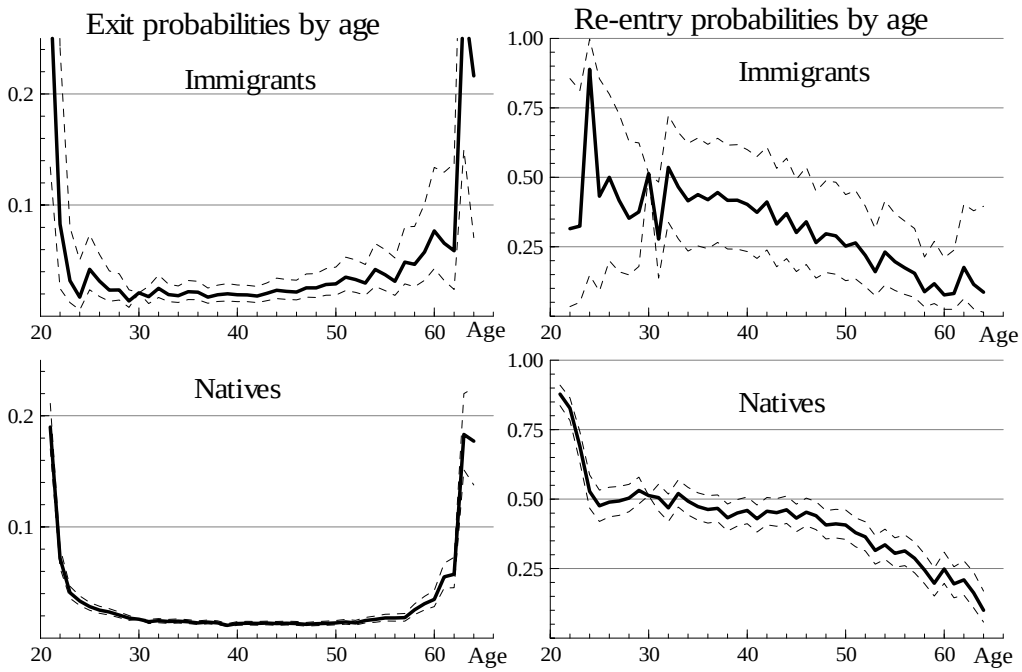
Note: Dotted lines indicate 90 percent confidence intervals. The probabilities are normalized to match the mean observed transition rates at YSM=5.

In Figure 6, we plot the estimated impact of age on exit and re-entry for immigrants and natives, respectively. The exit probabilities exhibit strongly U-shaped patterns with high exit rates at young and old ages, while the re-entry rate declines with age. Both of the exit and re-entry profiles are fairly similar for immigrants and natives. The rise in the exit rate associated with aging appears somewhat earlier for immigrants (around the age of 45) than for natives (around the age of 55), consistent with the pattern that immigrants who leave employment are more likely to enter an absorbing state such as disability pension retirement.

F. The role of business cycle fluctuations

In Norway, the 1970s were characterized by high labor demand and extremely low unemployment; see Figure 7. During the 1980s, however, unemployment started to rise and – apart from a brief recovery in the mid 1980s – rose steadily until it reached its peak level in 1993.

Figure 6: Exit and re-entry probabilities by age



Note: Dotted lines indicate 90 percent confidence intervals. The probabilities are normalized to match the mean observed transition rates at age 30, for immigrants and natives, respectively.

Economic fluctuations enter our statistical model both through the calendar year dummies and through the inclusion of the local unemployment rate (given the difficulty of interpreting calendar time effects in isolation, we do not report these here; they are listed in the Appendix). Differential responsiveness of immigrants and natives to economic conditions is allowed for only through the effect of the local unemployment rate; see Table 3, Panel C. The estimates indicate that the degree of cyclicality in transition probabilities indeed differs between the two groups: Changes in local unemployment affect the immigrant transition probabilities significantly more than those of natives, both from a substantive and from a purely statistical point of view (the null hypothesis of equality of coefficients is rejected at the 5 percent level for both exit and re-entry probabilities). According to the estimates, the three percentage point increase in aggregate unemployment that occurred between the mid 1980s and the mid 1990s, raised the immigrant exit rate by 0.6 percentage point and lowered their re-entry rate by 4.5 percentage points. For natives, the

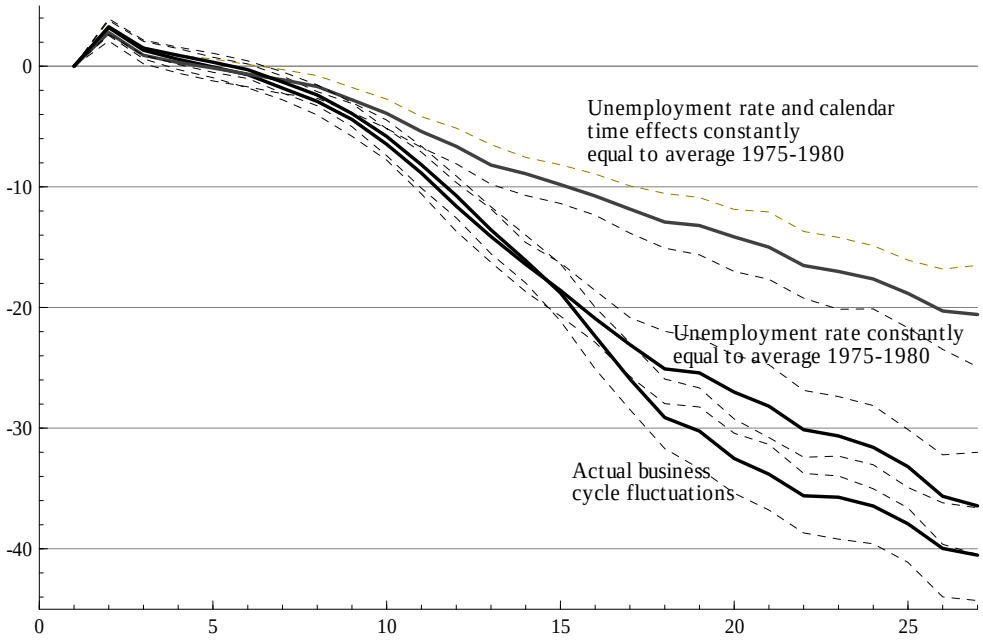
Figure 7: Unemployment rates in Norway 1971-2000

Note: Standardized unemployment rates. Source: OECD.

corresponding effects were only a 0.2 percentage point increase in the exit rate and a 1.1 percentage point reduction in the re-entry rate.

Figure 8 illustrates the potential impact of business cycles on the immigrant-native employment differential, by comparing the results from model simulations made under the counterfactual assumption that the favorable cyclical conditions at the time of immigration continued throughout the sample period with simulations made using actual cyclical conditions. We examine two alternative counterfactual cyclical patterns. The first holds both unemployment rates and calendar time effects constant at their 1975-1980 averages. Realizing that calendar time effects not necessarily represent cyclical fluctuations only, but also other time trends in the data, we also study the impact of keeping only the local unemployment rates constant at their 1975-1980 average. As the figure shows, the impact of cyclical fluctuations is much larger for immigrants than for natives. Had the favorable employment conditions of the late 1970s

Figure 8: Immigrant-native employment differential under alternative cyclical environments



Note: Dotted lines indicate 90 percent confidence intervals.

prevailed, the employment differential at the end of the sample period would have been half of the observed difference. The predicted immigrant employment rate after 27 years is raised from 48 to 76 percent, and the native rate is raised from 88 to 96 percent (not shown in the figure). Had only local unemployment rates kept constant at their 1975-1980 average, the employment differential would have been reduced by about four percentage points (10 percent).

Given that calendar year effects are restricted to be the same for immigrants and natives, the large impact of holding calendar effects constant may appear surprising. To a certain extent, the finding simply mirrors the fact that the scope for increasing employment rates is smaller the closer they already are to unity (which is captured in the functional form of the probability function). But it also reflects that the long-term effects of an economic slowdown are more severe for immigrants than for natives. The reasons for this are, first, that immigrants more rapidly become disconnected from the labor market through a deterioration of re-employment prospects (i.e., they face a stronger negative duration dependence in re-entry rates), and, second, that even

when they obtain a new job, it takes longer for the job to become secure (i.e., they have weaker negative duration dependence in exit rates than natives).

IV. Mechanisms

The strong decline in immigrant employment over the lifecycle, accompanied by high propensities to collect social security transfers such as disability pensions and rehabilitation assistance, raises concerns about increased labor immigration from developing countries as a panacea to battle the problems of an aging population. But the policy implications of our findings depend on the nature of underlying causal mechanism(s) and whether the circumstances faced by any future non-European labor immigrants are comparable to those of the cohort under study. This section discusses some key mechanisms that may explain our findings, such as disproportional sorting of immigrants into 'bad' jobs, immigrant-biased technological change, and weaker work incentives facing immigrants than natives. To shed light on these potential explanations, we exploit a number of additional data sources, among them micro data from the 1980 Census (with information on occupation and industry in 1980, conditional on employment at that time) and a complete administrative register of social security payments since 1992. Because of limitations of the data, however, we emphasize that the ambition of this section is to present a body of convincing circumstantial empirical evidence rather than consistent estimates of causal mechanisms.

A. Health and employability

Given that a large fraction of the non-employed labor migrants end up in disability retirement, an apparent explanation for the immigrant-native employment differential is that the migrant cohort has poorer health than the native control group. According to data from the national level of

living surveys from 1995/96, there is, however, no general tendency for nonwestern immigrants to report higher frequencies of long-lasting health problems than natives (Blom and Ramm, 1998). But, while younger immigrants (those below 45) report fewer health problems, older immigrants report more health problems than natives. Moreover, given that they have a long-lasting health problem, a larger fraction of immigrants report that the problem limits their ability to work. The evidence from these health surveys thus fits the broad age pattern discussed in the prior section, showing that the increase in the exit rate from employment starts at a younger age and is slightly larger for immigrants than for natives (see Figure 6).

Based on our own administrative data, we can address the health hypothesis indirectly by examining mortality rates for the immigrant and native samples during the five-year period *after 2000* (i.e., conditional on survival through 2000 and not having outmigrated by the end of 2005).[15] These mortality data reveal only minor differences between the two groups: the overall mortality rate is 3.3 percent for the migrant group and 3.4 percent for the native control group. As in the health survey data cited above, we find signs of a steeper age gradient for immigrants. To illustrate, for the two oldest birth cohorts (those born in 1936 and 1937) the five-year mortality rate was 13.6 percent among immigrants and 9.2 among natives. Conversely, for those born after 1942, mortality was slightly lower for migrants than for natives (2.5 vs. 2.7 percent)—although these group differences are not statistically significant even at the ten percent level. Further, if we restrict our employment analyses to those born after 1942, the differences between native and immigrant profiles remain large. Between 1980 and 2000, the immigrant employment rate for the

[15] Non-employment and disability pension uptake may of course be caused by less severe health issues, but it turns out that post-2000 mortality correlates strongly with prior employment status. For example, in 1990 the employment rate was ten percentage points lower among those who died in the 2001-2005 period than among those still alive by the end of 2005 (.62 vs. .72 among immigrants and .82 vs. .92 among natives).

younger birth cohorts fell from 97 to 56 percent, compared to a decline from 95 to 89 percent for natives. In conclusion, even though immigrants report more work-limiting health problems and their health gradient appears to be steeper than that of natives, the overall health differences between the two groups are too small for health to be the dominant explanation of the employment dissimilation among immigrants.

B. Cultural retirement determinants

The short employment careers may reflect that some of the labor migrants are equipped with cultural norms from their home country regarding the 'normal' age of retirement that deviate from the relatively high retirement age in Norway. As such, participation patterns may develop independently of employment location. There is indeed substantial evidence indicating that country of origin is one of the most important factors for explaining labor market assimilation of immigrants in industrialized countries (Bauer *et al.,* 2000). Moreover, studies of labor force participation in the United States attribute part of the variation to cultural factors. For example, Antecol (2000) finds that patterns of employment in the immigrant population relate to employment rates in the source country, and Fernández (2007) shows that hours worked among second-generation American women correlate with cultural proxies such as female labor force participation and survey-based evidence on attitudes towards women's work in the country of ancestry.

Employment patterns in the source countries of the immigrants covered by our study do, however, not lend support to the idea that the labor migrants brought with them a culture for early retirement. As it turns out, we find no decline in the employment propensities among 45-64 year old males in these countries that resembles the pattern observed for the migrant cohort in Norway. For example, the 2003-2004 employment rates (i.e., labor force participation adjusted for unemployment) for males in Pakistan's Punjab region were 0.94 for those aged 45-49, 0.92 for ages 50-54, 0.86 for ages 55-59, and 0.76 for the 60-64 age group (Pakistan Federal Bureau of

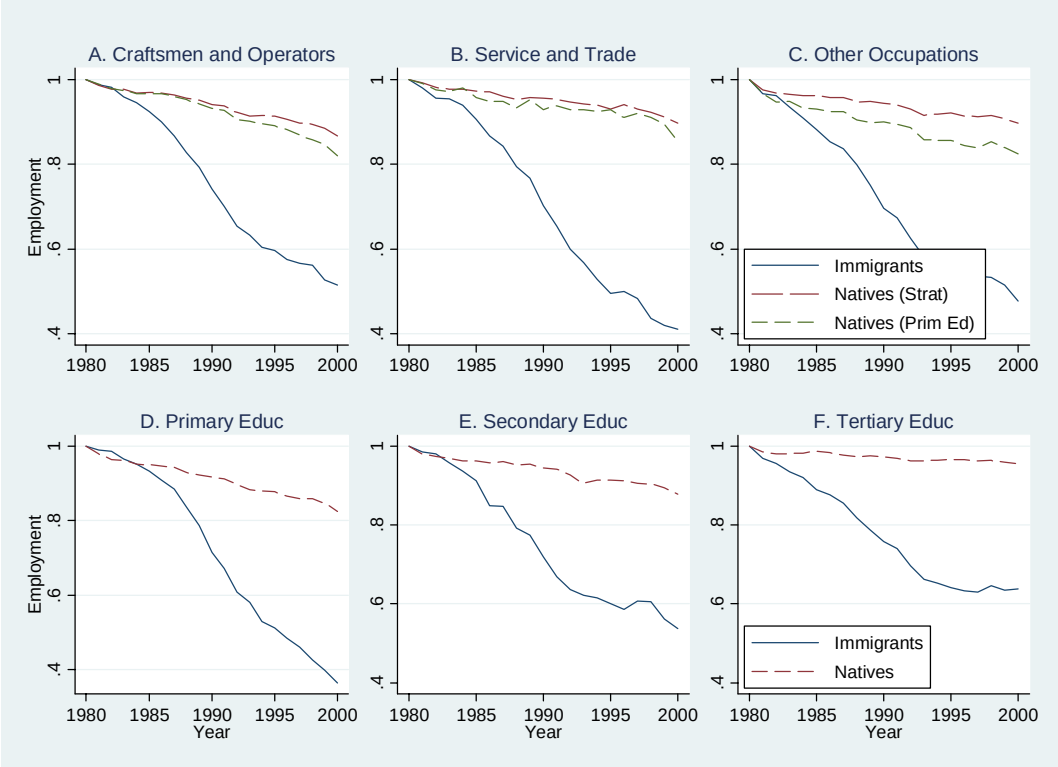
Statistics, 2004). If anything, these figures resemble those of our native-born reference group, not the cohort of labor migrants. Moreover, these patterns are consistent with the evidence from estimation of the dynamic model of the previous section, showing that the immigrant-native employment differential primarily evolves with years since migration, and not age.

C. Differences in jobs and immigrant-biased technological change

One potential explanation for the poor long-term employment performance of immigrants holds that they were overrepresented in dead-end jobs, for which there was a high probability of subsequent job loss. This explanation is consistent with the high and cyclical immigrant exit from employment identified in section III. A related hypothesis holds that skill-biased technological change (*SBTC*) reduced the demand for low-skilled manual labor and increased the demand for communication skills. For example, Autor *et al*. (2003) argue that computer technologies have substituted for workers performing tasks that can be accomplished by following explicit rules, and increased demand for workers performing non-routine problem solving and complex communications tasks. Such developments may have harmed the employment prospects of nonwestern immigrants in general and minority labor migrants recruited by manufacturing industry in the early 1970s in particular. In fact, recent evidence from Norway shows that relative employment prospects of persons in the lower tail of the wage distribution, conditional on work experience and educational attainment, deteriorated during the 1990s (Røed and Nordberg, 2004). Moreover, as argued by Rosholm *et al*. (2006), changes in organizational structure toward more flexible work organizations may have increased the importance of language proficiency and other country-specific skills and, thus, reduced the attractiveness of immigrant employees over time.

Our empirical checks of these explanations build on analyses of a subset of the full sample for which we are able to match additional information about job and employment characteristics

Figure 9: Employment profiles of immigrants and natives, by 1980 occupation and education



collected from the 1980 Census (and conditional on employment that year).[16] If initial job characteristics explain the decline in immigrant employment, the immigrant-native differential during the late 1980s and 1990s should drop significantly when we compare workers with similar jobs. The upper panels of Figure 9 display employment profiles for immigrants and natives within broadly defined occupational groups. These panels clearly show that the immigrant-native employment differentials remain large even conditional on initial occupation. It may be the case that immigrants were more likely to get jobs in firms and industries with shrinking employment

[16] We use 1980 data to proxy for the initial job, although surely many of the labor migrants by that date had changed jobs from their initial employer. Unfortunately, we are unable to track jobs during the 1970s. We note however that the Norwegian labor market was remarkably stable during the late 1970s with the unemployment rate averaging 1.7 percent (see Figure 7), and that 97 percent of the migrants were employed in 1980.The matching with census records yielded a slightly older immigrant sample, and we therefore re-stratified the native reference group to match the age distribution of the new sample.

within these broad occupations, e.g., because they were rewarded less than natives for their educational investments (as seen in the estimation results presented in Section III D). To assess this hypothesis, the upper panels of the figure add employment profiles for native comparison groups consisting of individuals with *primary education only*. It is evident that the large immigrant-native employment differentials persist even with this low-skill native comparison group, suggesting that only a small proportion of the employment gap can be attributed to differences in valuation of schooling.[17]

The employment profiles in the upper panel of Figure 9 show that the strongest employment reductions *among natives* during the 1980s and 1990s were recorded for craftsmen and operators. As it turns out, in 1980 the migrant group was strongly overrepresented in these occupations; 46 percent of the migrants held craftsmen and operator jobs (typically in the manufacturing sector). Hence, it is indeed the case that immigrants were disproportionally employed in declining industries. On the other hand, the immigrants' own employment propensities declined even more in other sectors of the economy. And the relative decline was greatest in service and trade occupations. The latter finding is consistent with the hypothesis that migrants were harmed by increasing emphasis on language skills over time.

One might expect that more educated immigrants are less affected by technological change and increased relative demand for high-skilled labor, and, hence, that the immigrant-native employment differential should diminish with attainment. The lower panels of Figure 9 display employment profiles by educational attainment. The graphs clearly show that the decline

[17] We have also constructed an alternative native comparison group by matching on earnings in 1980. The motivation behind this exercise is to investigate whether our results are driven by the native group having better jobs than the migrants, conditional on occupation and education. As it turns out, the employment profile of this alternative comparison group sits slightly below, but is barely distinguishable from the comparison groups used in Figure 9.

in employment over time was most severe for the least educated, and this is true for both immigrants and natives. There remains a substantial employment differential at the end of the period within each education group, however, and it is interesting to note that while the employment rate declined by only four percentage points among highly educated natives, it declined by 36 percentage points among similarly educated immigrants. In comparison, the largest employment decline for any of the native groups in the figure is 18 percentage points (natives with compulsory schooling only).

The occupational and educational classifications in Figure 9 are quite broad, and may therefore conceal important differences between the immigrant and native distributions at a more detailed level. As we narrow the classifications, it indeed turns out that initial job and education characteristics account for a significant part of the subsequent immigrant-native employment differential. This is documented in Table 4 where we use linear probability regressions to address the extent to which the employment differential in 2000 can be explained by variation in job attributes, as captured by 69 occupations, six levels of educational attainment, 41 industries, 19 regions, and pay, all measured 20 years earlier. Again, the analysis is based on those in the census-matched samples who were employed in 1980. In panel A we report the coefficient of the immigrant indicator variable in the 2000 employment regressions when immigrants and natives samples are weighted so as to have equal importance in the regression. We see first that the overall sample differential in 2000 of 0.406 is reduced to 0.324 when we condition on job attributes (column 2). If we further impose immigrant returns to education to be zero (which implies a differential relative to natives with primary schooling only), the estimate falls to 0.274 (column 3). In other words, differences in 1980 job types explain 20 to 33 percent of the difference in employment in 2000. Panel B lists the same coefficients in the un-weighted sample.

Table 4: Year 2000 employment regressions, immigrant-native differential

	(1)	(2)	(3)	(4)	(5)	(6)
A. Weighted Regression	-.406 (.009)	-.324 (.013)	-.274 (.015)	-.282 (.010)	-.238 (.014)	-.187 (.015)
Adj R^2	.191	.258	.235	.235	.286	.269
B. Unweighted Regression	-.406 (.009)	-.345 (.013)	-.302 (.014)	-.316 (.011)	-.280 (.014)	-.236 (.015)
Adj R^2	.154	.203	.193	.185	.221	.213
Controls:	None	1980 Job Attributes	Job Attributes, Primary Educ Reference	Family Structure	Job Attributes and Family Structure	Job Attributes, Primary Educ Reference, and Family Structure

Note: Standard errors are reported in parentheses. Coefficient estimates are based on linear probability models; sample size is 11,230. The vector of job attributes includes indicator variables for industry (41), occupation (69), county of residence (19), educational attainment (6), and average pay over the 1980-84 period. The family structure controls include whether married with spouse present in 2000, whether spouse is a homemaker, and 9 indicator variables for number of children ever born. In columns (3) and (6), immigrant schooling is set to equal to primary education. Panel A weights regressions so that immigrant and native subsamples receive equal weight.

In the un-weighted regression, a smaller part of the immigrant-native employment differential is accounted for by differences in job attributes (0.061 vs. 0.082 in column 2), reflecting the fact that coefficient estimates of control variables in general are larger when based on the immigrant sample.

In sum, we find that the decline in employment over time was much larger for less educated than for highly educated workers, and that differences in the 1980 job distributions of immigrants and natives account for a sizable share of the observed employment differential in 2000. Such empirical patterns are consistent with the hypotheses that the labor migrants initially were recruited into jobs in declining industries and that their employment careers were adversely affected by skill-biased technological change. Yet, these explanations do not fully account for the relative decline in immigrant employment, as there remain sizeable unexplained immigrant-native employment differentials regardless of educational attainment or initial job type.

D. Welfare program incentives

A generous welfare state might undermine work incentives, and several features of the Norwegian system may give the immigrant population less economic gain from employment than natives.[18] First, immigrant wages tend to be lower, and they therefore typically face higher social security replacement *ratios* in a welfare system with relatively high minimum benefits. Second, the family structure of many immigrant households makes them eligible for supplementary benefits if they are temporarily out of work or become permanently disabled. As we show below, family-related allowances can have a considerable impact on the financial incentives embedded in the social security system.

One way to assess the overall role of family structure is again to consider employment status in 2000 and calculate the proportion of the immigrant-native differential that can be attributed to family characteristics that are relevant for welfare benefits; see Table 4, column (4). When the regression controls for marital status, whether or not the spouse is a homemaker, and the number of children ever born, the 2000 employment differential drops from 0.406 to 0.282 (in the weighted regression), implying that differences in family structure explain more than 30 percent of the observed differences in employment status. In column (5), we combine job and family characteristics, which lowers the differential even further. And, in column (6), we use the most extensive model specification along with the restriction that immigrant returns to education are zero, which reduces the differential by approximately one half. Based on the last column, one can assess the marginal effects of job attributes versus the family structure controls. This exercise shows that omitting the family structure variables or omitting the job controls from the

[18] Moreover, work disincentive effects are likely to be reinforced by network effects transmitting information about welfare programs within the immigrant group (Borjas and Hilton, 1996; Bertrand *et al.*, 2000).

specification raises the immigrant-native differential by substantial amounts. For example, comparing the estimates listed in columns (3), (4), and (6), the marginal contribution of job attributes equals 23 (panel A) or 20 percent (panel B) of the overall differential, while the contribution of family structure is 21 or 16 percent. According to these numbers, the two sets of factors account for similar shares of the observed immigrant-native employment differential.

To gain insight into the mechanisms behind the role played by family structure, it is useful to consider the details of the welfare system. In particular, the disability pension system is comprised of means-tested payments for dependent spouses and children. These extra benefits can be quite substantial; currently (2008-2009) up to NOK 35,000 (about $5,800) per year for a dependent spouse and NOK 28,000 for each child, and these benefits come on top of a replacement ratio that is already around two thirds of prior earnings and are subject to preferential tax treatment.[19] As a result, low-wage earners with many children can obtain effective replacement ratios that exceed 100 percent. This point is illustrated in Table 5, where we report actual disability pension payments and two alternative measures of replacement ratios before tax for disability claimants in our two samples in 2000. (Note that net replacement ratios will be higher than those listed in the table, as disability benefits are taxed at a lower rate than labor earnings.) As the table documents, disability benefits rise sharply with the number of children. Among immigrants with four or more children, 8.9 percent of the disabled actually receive a higher annual income from pensions than they *ever* earned in the labor market, and as many as 63.7 percent have a higher income on disability retirement than they had on average while active in the labor market. The relationship between replacement ratios and family structure is fairly

[19] The child allowance was raised from 25 to 40 percent of the social security base amount in 2002. Means-testing was introduced in 1992.

Table 5: Permanent disability pension benefits in 2000 relative to prior earnings

	Immigrants					Natives				
		Benefits compared to best earnings year		Compared to average earnings all years employed			Benefits compared to best earnings year		Compared to average earnings all years employed	
	Mean benefit (1000 NOK)	Mean replace-ment ratio	Fraction with ratio > 1	Mean replace-ment ratio	Fraction with ratio > 1	Mean benefit (1000 NOK)	Mean replace-ment ratio	Fraction with ratio > 1	Mean replace-ment ratio	Fraction with ratio > 1
All	159	.547 (.238)	.031	.854 (.360)	.262	139	.505 (.215)	.016	.855 (.544)	.190
By #children in 2000:										
0	131	.455 (.159)	.005	.711 (.250)	.089	138	.500 (.211)	.014	.846 (.547)	.174
1	149	.516 (.213)	.022	.795 (.293)	.189	140	.510 (.225)	.019	.861 (.530)	.212
2	160	.564 (.216)	.014	.878 (.343)	.266	145	.532 (.219)	.016	.896 (.465)	.262
3	184	.614 (.220)	.066	.977 (.341)	.401	144	.555 (.232)	.031	1.036 (.664)	.415
4+	212	.722 (.335)	.089	1.126 (.488)	.637	185	.647 (.301)	.083	1.107 (.479)	.625

Note: Standard deviations are reported in parentheses. Samples consist of individuals who received permanent disability pension benefits in 2000. Samples are further restricted to individuals with at least five years of prior labor market earnings and whose average earnings in the three best years were at least 2*G* (i.e., the equivalent of NOK 98,180 in 2000). Number of children refers to children aged 0-17 in 2000.

similar for immigrants and natives. The major difference in financial incentives arises from the fact that immigrants and natives tend to have very different family structures. For example, while only 10 percent of the native men have four or more children, this is the case for 52 percent of the migrants. And while only 20 percent of the married native men have a non-working spouse in 2000, this is the case for no less than 70 percent of the migrants.

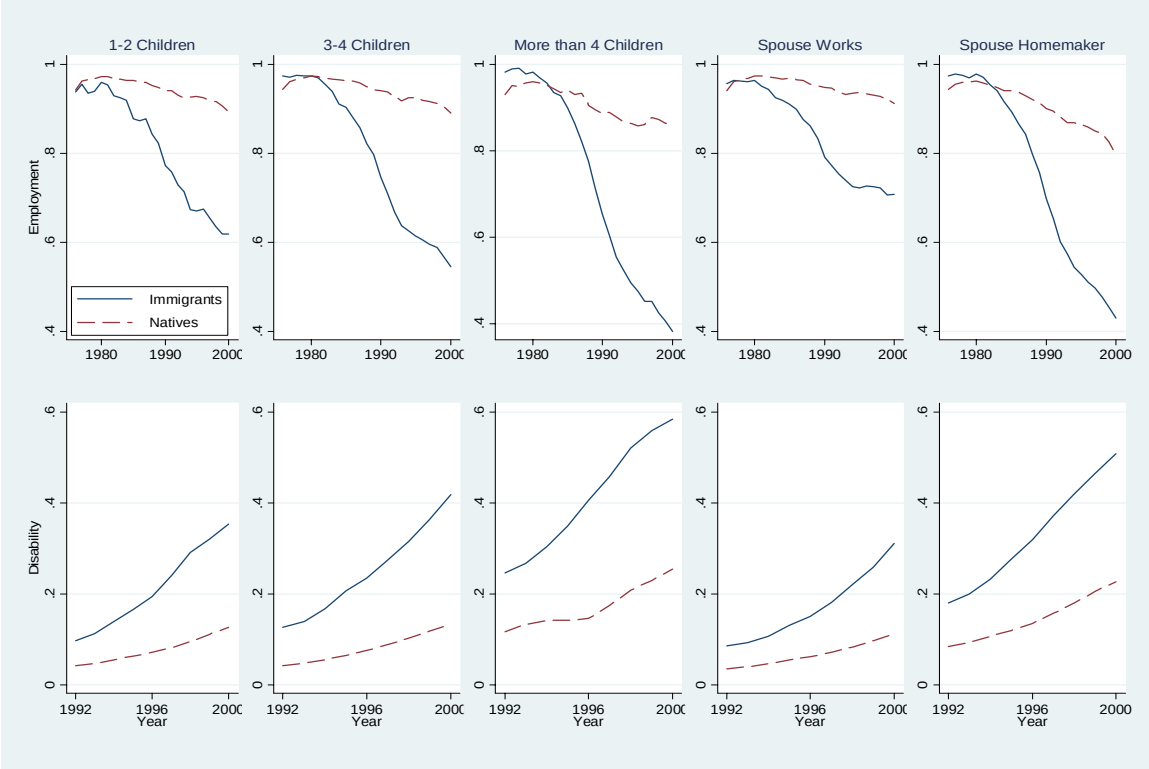
Existing empirical evidence from Norway indicates that employment decisions are indeed responsive towards financial incentives, particularly within relatively poor households. Aaberge *et al*. (2000) estimate participation elasticities for married couples *by household income*, and

report that, in the lowest decile, the husband's participation elasticity with respect to own net wage is as high as 1.89, compared to an average elasticity of 0.17.[20] If disability insurance is a viable alternative to work, the benefit calculation rules imply that male household heads of families with many children and a non-working spouse have little to gain from labor market participation, and, hence, are less likely to work and more likely to be on disability. The patterns in Figure 10 are striking and strongly confirm these predictions. The first three columns contrast the employment and disability rates over time for household heads according to their number of children. The panels reveal clear associations between employment and disability patterns and the number of children, where more children go hand in hand with lower employment and higher disability rates. To illustrate, while six of ten immigrant fathers with one or two children are employed in 2000, fewer than four in ten are employed among those with more than four children. And, while about 35 percent of immigrant fathers with one or two children are disabled in 2000, close to 60 percent of those with many children receive a disability pension. Similarly, native men with four or more children are twice as likely to be on disability as those with fewer children.

To address the role the spouse's work status, the final two columns of Figure 10 sketch trends in employment and disability for married men with and without a dependent spouse. The panels show that the wife's work status correlates strongly with own employment and disability status. Roughly speaking, towards the end of the sample period those with a dependent spouse are

[20] There is to our knowledge little direct empirical evidence on the impacts of financial incentives embedded in the disability insurance system on labor supply in Norway or the other Nordic countries. Evidence collected from the unemployment insurance system (Røed and Zhang, 2003; 2005) and the vocational rehabilitation system (Nordberg, 2008) suggests that social insurance parameters do have significant impacts on employment propensities. Quasi-experimental evidence from Canada presented in Gruber (2000) indicates that the elasticity of non-participation with respect to disability insurance benefits is around 0.3. Autor and Duggan (2006) list the rise in the benefit replacement rate as one of three factors contributing to the increase in US disability enrollment since 1984.

Figure 10: Employment and disability retirement by number of children and spouse's work status



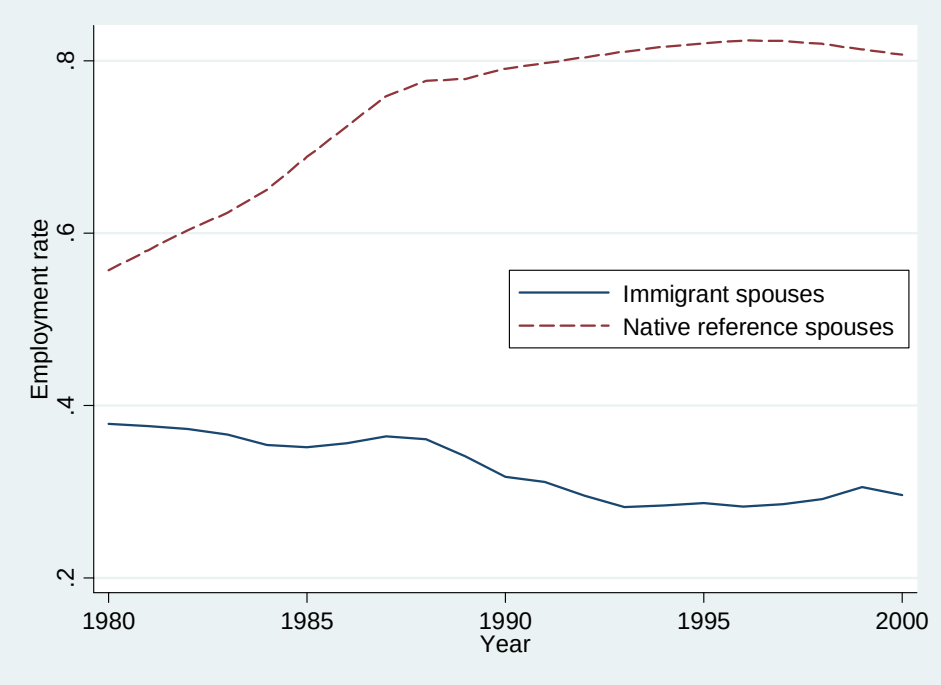
Note: Samples consist of married individuals with a spouse present in 2000. Number of children refers to children ever born. Sample sizes for immigrants and natives, respectively, are 495 and 14,362 (1-2 children); 1122 and 8767 (3-4 children); 736 and 771 (more than 4 children); 705 and 20,158 (spouse works); and 1675 and 4810 (spouse homemaker). Note that employment and disability states are not mutually exclusive, reflecting transitions during the year as well as partial disability (see also Table 2).

twice as likely to be non-employed and on disability compared to those with a working spouse, and this is the case for both immigrants and natives.

The employment careers of migrants' spouses will also affect the fiscal consequences of labor immigration directly. Figure 11 compares the employment patterns over time for spouses of the labor migrants under study and the native comparison group. The two groups exhibit strikingly different trends over the sample period.[21] While the spouses of natives follow the

[21] The trend line for immigrant spouses confounds years-since-migration and cohort effects. Sixty-one percent of the immigrant spouses were present in Norway in 1980, and their employment rate declined from 40 percent in 1981 to 34 percent in 2000. Employment rates for spouses who arrived during the 1980s increased from 19 percent in 1991 to 25 percent in 2000.

Figure 11: Spouses' employment 1975-2000, by immigrant status



Note: Samples consist of 2380 spouses of immigrants and 24,968 spouses of natives. Employment rate is conditional on residence in Norway and age between 25 and 64.

general development of rising female labor supply, this is not true for the spouses of the migrant group. And, in 2000, the immigrant-native employment differential for spouses is as large as 50 percentage points.[22] Differences between immigrants and natives in family structure, paired with the strong work disincentives for heads of large households embedded in welfare benefits, therefore seem to play a significant role in explaining the relative decline in employment among labor migrants.

It is important to stress that the evidence presented in this section is not based on data that allow us to isolate the underlying causal impacts. Family size will reflect preferences and may

[22] Looking at the combined population of married labor migrants and their spouses, we find that 40 percent were employed in 2000, while 61 percent claimed at least one type of social security transfer. Fifty-five percent of the immigrant households had at least one person receiving a permanent disability pension, compared to 25 percent for the native comparison group.

correlate with unobserved determinants of wages, health, and employability, although it is hard to find reasons why men with many children should be less productive or more prone to severe health problems than men with fewer children. Family structure follows from fertility choices and spousal employment status reflects joint household labor supply decisions. Thus, we cannot rule out the reverse causal links where favorable benefit replacement ratios for household heads with large families affect both spousal labor supply and fertility.[23] Nonetheless, if family structure and spousal labor supply are influenced by benefit rules, there is an additional effect of the welfare system operating through its impact on behavior to meet eligibility criteria. The assessment of fiscal consequences of labor immigration would therefore be similar even if welfare policy had a causal effect on fertility and spousal labor market participation in migrant households.

V. Conclusion

Male labor migrants from developing countries who came to Norway during the early 1970s had extremely short employment careers compared to a matched reference group of natives. Based on estimation of a simultaneous transition model between the states of employment and non-employment, we have found that the disparity in employment profiles between immigrants and natives primarily results from differences in non-employment incidence. Differential non-employment persistence also plays a role, particularly during economic downturns. The immigrant-native employment differential evolves chiefly as a function of years since migration, and only modestly from differences in age-employment profiles. We also identify a strong

[23] A large literature examines the impact of public policy on fertility. Hoem (2008) summarizes the evidence from recent European studies, and, although pointing to "demonstrated policy effects in specific circumstances" (p. 249), emphasizes the formidable methodological challenges facing this literature. Hardoy and Schøne (2008) conclude that the 'cash-for-care' subsidy during the first two years after birth introduced in Norway in 1998 affected the fertility behavior of native women, but not the fertility of immigrant women from non-OECD countries.

sensitivity of immigrant employment to business cycle fluctuations, and the long-term effect of an economic slowdown is more severe for immigrants than for natives. Immigrants are more rapidly disconnected from the labor market through deterioration of their re-employment prospects, and, when they obtain a new job, it takes longer to attain job security.

We uncover evidence consistent with the hypotheses that the labor migrants initially were recruited into jobs in declining industries and that their employment careers were adversely affected by skill-biased technological change. For example, differences in the 1980 job distributions of immigrants and natives account for up to one third of the observed employment differential in 2000. We also point out that the welfare system, with high benefit replacement ratios for household heads with a non-working spouse and many children, provides poor work incentives for families of the type that dominates the cohort of labor migrants. A surprisingly large fraction of the immigrant-native employment differential in 2000 can be attributed to differences in household characteristics: conditioning on family size and spousal employment status reduces the predicted differential by more than 30 percent. Although we hesitate interpreting this as evidence of a causal link, family characteristics explain as much of the immigrant-native employment differential as do 1980 job attributes.

Notwithstanding the problems of ranking the possible explanations, our results clearly indicate that early minority labor migrants to Norway have found it difficult or not worthwhile to sustain employment careers comparable to those of natives. From a policy perspective, one might question whether this finding has any bearing on admission policies of rich, welfare-state economies of today. Such concerns about external validity fall under two headings. First, one could argue that labor migrants today are carefully selected on the basis of skill and therefore will be better capable of sustaining lifecycle employment in the host country. However, although authorities can set admission criteria with respect to documented skills such as educational

attainment, it is difficult to eliminate self-selection based on, e.g., unobserved disability propensity. Also, one cannot easily impose skill requirements on subsequent family reunification. But, perhaps more important, the evidence presented in this paper is not built on a particularly negatively selected wave of immigrants. And our results show that immigrant-native differences in lifecycle employment are large regardless of educational attainment.

The second challenge to external validity comes from the argument that economic conditions have changed, and that the cyclical turbulence and industry restructuring of the 1980s and 1990s will not repeat itself. Labor migrants of today will surely work in other industries and face different economic environments than their predecessors. But cyclical fluctuations are not yet history, and there is no sign that structural change in employment across industries has become less intense over time. Portability of skills and language proficiency are no less important today. And the work disincentives embedded in the social insurance system, particularly for household types that are prevalent in many potential source populations, remain in place.

What this paper shows, is that initial employment upon arrival is no guarantee for lifetime employment. The poor long-run performance of the minority labor migrants followed in this study suggests that opening the border is not a panacea to solving the fiscal problems associated with an aging population. This cheerless conclusion is even more apparent if we also take into account the dismal employment record of the spouses of the labor migrants. To the extent that immigration policy is used to remedy demographic imbalances, it is essential that such policy is combined with a strategy to ensure a better and more stable utilization of the extra human resources.

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Appendix Table A1: Nonparametric Maximum Likelihood Estimation Results, Employment Status Transitions

A. Parameters assumed to be common for immigrants and natives

	From employment to non-employment		From non-employment to employment	
	Coefficient	**Std Error**	**Coefficient**	**Std Error**
Calendar year				
1971	0.1025	0.0767		
1972	0.1468	0.0735	-0.4394	0.1477
1973	-0.0156	0.0734	-0.2531	0.1337
1974	-0.0551	0.0709	-0.0864	0.1258
1975	0.0513	0.0684	-0.3949	0.1201
1976	-0.0956	0.0700	-0.0089	0.1159
1977	-0.2956	0.0728	-0.0195	0.1151
1978	-0.1377	0.0700	-0.0372	0.1168
1979	-0.0076	0.0689	-0.3224	0.1128
1980	Ref.		Ref.	
1981	-0.0055	0.0694	-0.2829	0.1126
1982	0.2935	0.0660	-0.5050	0.1128
1983	0.2387	0.0692	-0.6158	0.1093
1984	0.3106	0.0689	-0.6018	0.1123
1985	0.2539	0.0707	-0.5620	0.1097
1986	0.5125	0.0675	-0.5459	0.1082
1987	0.4741	0.0687	-0.7011	0.1079
1988	0.6907	0.0673	-0.9394	0.1099
1989	0.6415	0.0710	-0.8412	0.1132
1990	0.6612	0.0736	-1.0420	0.1155
1991	0.5235	0.0770	-1.0186	0.1172
1992	0.7729	0.0770	-1.0159	0.1214
1993	0.6291	0.0793	-1.2768	0.1226
1994	0.5196	0.0802	-0.9764	0.1199
1995	0.4596	0.0799	-0.9517	0.1195
1996	0.4333	0.0801	-1.1591	0.1206
1997	0.5386	0.0786	-1.0821	0.1179
1998	0.5796	0.0787	-1.0335	0.1184
1999	0.5674	0.0796	-1.1526	0.1205
2000	0.6631	0.0800	-1.1783	0.1209
Region				
Oslo	Ref.		Ref.	
East excl Oslo	-0.1007	0.0351	0.1103	0.0466
Inland	0.0046	0.0433	0.0638	0.0587
South	-0.0383	0.0533	0.0845	0.0691
West	-0.2449	0.0345	0.1558	0.0476
Central	-0.1652	0.0388	0.3290	0.0525
North	0.2098	0.0415	0.2922	0.0535
Local unemployment	3.4096	0.6483	-1.9743	0.9485
Unobserved heterogeneity	8 support points in the discrete distribution (results not reported)			

B. Parameters that are allowed to differ for immigrants and natives

	Immigrants				Natives			
	From employment to non-employment		From non-employment to employment		From employment to non-employment		From non-employment to employment	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
YSM								
3	-0.3016	0.3250						
4	-0.2506	0.2849	0.0171	0.6982				
5	Ref.		Ref.					
6	0.0504	0.2722	-0.6860	0.6861				
7	0.2981	0.2535	0.0799	0.5387				
8	0.3929	0.2501	-0.2033	0.6054				
9	0.3303	0.2499	-0.2770	0.5684				
10	0.6113	0.2471	-0.5377	0.5499				
11	0.8031	0.2438	-0.5450	0.5642				
12	1.1217	0.2383	-0.4233	0.5673				
13	1.2321	0.2426	-0.3484	0.5620				
14	1.3603	0.2418	-0.8304	0.5643				
15	1.2956	0.2484	-0.5634	0.5599				
16	1.3300	0.2535	-0.6770	0.5646				
17	1.2663	0.2557	-0.7263	0.5777				
18	1.3797	0.2623	-0.6011	0.5807				
19	1.5643	0.2683	-0.5220	0.5842				
20	1.2791	0.2738	-0.4207	0.5839				
21	1.3186	0.2772	-0.5999	0.5915				
22	1.3609	0.2813	-0.2227	0.5872				
23	1.3885	0.2767	-0.6581	0.5935				
24	1.2900	0.2759	-0.3309	0.5821				
25	1.1701	0.2830	-0.3699	0.5833				
26	1.2113	0.2873	-0.2643	0.5876				
27	1.3585	0.2948	-0.5047	0.5952				
28	1.2333	0.3079	-0.2402	0.6059				
29	0.9915	0.3303	-0.3040	0.6235				
Local un-employment	4.2967	1.8112	-5.8270	2.6805				
Immigrant	-0.3048	0.2750	0.1555	0.6433				
Age								
20					3.0887	0.0862		
21	2.9821	0.6088			2.6062	0.0805	1.9244	0.2070
22	1.4379	0.7639	-0.8281	1.5471	1.4970	0.0831	1.5170	0.1720
23	0.4314	0.5873	-0.7852	1.3354	0.9022	0.0843	0.7501	0.1572
24	-0.2071	0.6766	2.0289	2.3219	0.6915	0.0807	0.0605	0.1463
25	0.7185	0.3570	-0.3242	1.2400	0.5214	0.0784	-0.1486	0.1376
26	0.4182	0.3560	-0.0525	0.8392	0.4017	0.0774	-0.0946	0.1297
27	0.1155	0.3440	-0.3871	0.8003	0.3260	0.0747	-0.0777	0.1263
28	0.1187	0.3003	-0.6589	0.6896	0.2026	0.0747	-0.0365	0.1200

29	-0.4306	0.3362	-0.5594	0.6141	0.0581	0.0752	0.0731	0.1177
30	Ref.		Ref.		Ref.		Ref.	
31	-0.1833	0.2664	-1.0066	0.5371	-0.1388	0.0761	-0.0299	0.1180
32	0.1829	0.2451	0.0905	0.4941	-0.0879	0.0727	-0.1769	0.1200
33	-0.0728	0.2423	-0.1909	0.4917	-0.1308	0.0746	0.0304	0.1186
34	-0.1291	0.2422	-0.3940	0.5098	-0.1086	0.0740	-0.0812	0.1203
35	0.0514	0.2354	-0.3018	0.5054	-0.1494	0.0742	-0.1587	0.1198
36	0.0310	0.2325	-0.3784	0.4902	-0.2190	0.0748	-0.1998	0.1212
37	-0.2008	0.2395	-0.2712	0.4834	-0.1693	0.0739	-0.1848	0.1174
38	-0.0824	0.2289	-0.3862	0.4889	-0.2175	0.0747	-0.3216	0.1202
39	-0.0435	0.2352	-0.3841	0.4920	-0.3917	0.0771	-0.2508	0.1172
40	-0.0887	0.2355	-0.4465	0.4840	-0.2657	0.0760	-0.2150	0.1179
41	-0.0946	0.2334	-0.5688	0.4958	-0.2486	0.0765	-0.3355	0.1207
42	-0.1450	0.2403	-0.4102	0.4857	-0.2606	0.0772	-0.2267	0.1206
43	-0.0219	0.2361	-0.7519	0.5034	-0.2360	0.0768	-0.2457	0.1223
44	0.1092	0.2391	-0.5840	0.4895	-0.2671	0.0787	-0.2056	0.1204
45	0.0637	0.2418	-0.8931	0.4913	-0.2430	0.0805	-0.3268	0.1222
46	0.0402	0.2451	-0.7148	0.4917	-0.2687	0.0808	-0.2388	0.1221
47	0.2032	0.2486	-1.0720	0.4970	-0.3260	0.0833	-0.2925	0.1247
48	0.1982	0.2554	-0.9149	0.4933	-0.2827	0.0838	-0.4282	0.1284
49	0.3136	0.2558	-0.9508	0.5010	-0.2519	0.0865	-0.4116	0.1295
50	0.3354	0.2621	-1.1372	0.5063	-0.2226	0.0875	-0.4281	0.1332
51	0.5292	0.2630	-1.0786	0.5060	-0.1619	0.0904	-0.5445	0.1348
52	0.4666	0.2699	-1.3244	0.5163	-0.2218	0.0948	-0.6077	0.1382
53	0.3586	0.2801	-1.7056	0.5323	-0.0713	0.0956	-0.8280	0.1447
54	0.7166	0.2824	-1.2535	0.5224	-0.0135	0.1003	-0.7338	0.1472
55	0.5921	0.3003	-1.4600	0.5284	0.0649	0.1037	-0.8746	0.1518
56	0.4145	0.3227	-1.6104	0.5489	0.0686	0.1101	-0.8352	0.1557
57	0.8699	0.3241	-1.7515	0.5610	0.0786	0.1167	-0.9614	0.1637
58	0.8246	0.3556	-2.3849	0.6215	0.4129	0.1166	-1.1760	0.1762
59	1.0486	0.3678	-2.0731	0.6212	0.6108	0.1234	-1.4564	0.1920
60	1.3557	0.3753	-2.5427	0.7073	0.7371	0.1298	-1.1586	0.1827
61	1.1863	0.4549	-2.4680	0.7599	1.2162	0.1297	-1.4695	0.2151
62	1.0719	0.5651	-1.5980	0.6997	1.2597	0.1516	-1.3786	0.2258
63	2.9373	0.5026	-2.0957	0.9410	2.5622	0.1386	-1.6894	0.2838
64	2.5545	0.7803	-2.4052	1.1696	2.5220	0.1813	-2.2460	0.3641
Educational attainment								
<=9	Ref.		Ref.		Ref.		Ref	
10-11	0.0446	0.0881	0.4670	0.1056	-0.2716	0.0281	0.3099	0.0369
12	-0.3572	0.1158	0.5648	0.1419	-0.7731	0.0406	0.4696	0.0609
13-15	-0.2323	0.1219	0.5320	0.1656	-0.4201	0.0455	0.3239	0.0653
16+	-0.1539	0.1026	0.6538	0.1287	-0.7748	0.0411	0.4704	0.0629
Missing	0.3550	0.0943	0.1354	0.1124	0.3522	0.1541	0.0165	0.1900
Duration dependence								
1 year	0.5873	0.0764	1.0936	0.0848	1.3323	0.0296	0.8685	0.0388
2 years	0.4426	0.0929	0.5989	0.0918	0.9443	0.0357	0.4227	0.0377
3 years	Ref.		Ref.		Ref.		Ref	